

**NASA Space Shuttle Program (SSP)
Mission Management Team (MMT) STS-114
Minutes of Meeting
August 1, 2005**

The STS-114 Flight Day 7 (FD7) MMT meeting, chaired by Deputy Manager, SSP, JSC-MA/Wayne Hale, was held August 1, 2005 at 1:00 p.m. Central Time (CT), Johnson Space Center (JSC), Building 30, Room 118. Member organizations supported at JSC and remote sites by video teleconference. Roster sheets for those that participated in this meeting are available. Following are highlights of the issues that were discussed.

A. Introduction – MMT Chairman

Mr. Hale gave a few introductory remarks, and reviewed the items to be covered in today's meeting.

B. Flight Status – Mission Operations Directorate (MOD) Failure Summary

JSC-DA/R. E. Castle summarized FD7 mission events, including 1) completion of extravehicular activity (EVA)-2, 2) gaseous nitrogen (GN₂) transfer resumed post EVA-2, and 3) transfer status. Mr. Castle reported there was a shuttle airlock hatch closing issue, but the hatch closed during EVA-2 with no problems reported. There have been no further impacts.

Mission STS-114 is proceeding with the nominal timeline. Mr. Castle noted that a decision is requested by the end of the MMT meeting today (FD7) regarding the requirement for the EVA gap filler task.

C. Mission Integration Status

JSC-MO/Robert Galvez, STS-114 Flight Manager, in relating consumables transfer activity, reported 1) 40% of resupply items to International Space Station (ISS) and 4% of return items from ISS to the Middeck, 2) multipurpose logistics module (MPLM) prepack bags have been positioned in the MPLM, 3) eight contingency water containers (CWCs) transferred to date, and 4) 23.7 lbs. of nitrogen (N₂) transferred.

Mr. Galvez added the number of tasks to be completed would be dependant on the MMT's decision regarding a contingency EVA for gap filler removal.

D.

Space Shuttle Safety and Mission Assurance (S&MA)

JSC-MX/Terry Wilcutt reported S&MA has added one new anomaly to the Risk Matrix, lockup of STS-3 Payload General Support Computer (PGSC)/760XD when Vehicle Integrated Performance, Environments, and Resources (VIPER) Potable Computer Memory Card International Adapter (PCMCIA) card was inserted. This is a Level 3 anomaly.

E. Integrated Anomalies/Issues Summary

JSC-MS/John Muratore presented the System Engineering and Integration (SE&I) Integrated Anomalies list, located on the MMT website at:

http://sspweb.jsc.nasa.gov/webdata/mmtmeeting/flt/114/050801.1300_D7/12_.pdf

F. Action 114-MMT-007 EVA Procedure to Effectively Eliminate Concerns Regarding Protuberance of Gap Fillers and Plan to Schedule EVA Activity to Repair Gap Fillers

Action 114-MMT-007 to MOD, to develop an EVA procedure to effectively eliminate concerns regarding protuberance of gap fillers and to develop a plan to schedule EVA activity to repair gap fillers, was closed. JSC-DA8/Kelly Beck reported that the risks associated with gap filler robotics/EVA task and mitigation have been identified. The hazards have been assessed, and controls are available. MOD recommends three EVAs and consideration of a fourth only if needed. Detailed procedures and timeline development are in work to support a modified EVA3 on FD9 and will be given to the crew when they wake on FD8, if approved by MMT.

G. Action 114-MMT-008 Risk of Performing an EVA to Repair Gap Fillers versus Fly As-Is

Action 114-MMT-008 to Safety and Mission Assurance, to evaluate the risk of performing an EVA to repair gap fillers versus flying as-is, was closed. JSC-MV/Steve Poulos reported that Orbiter recommends an EVA to remove the protruding gap fillers.

JSC-EG/Chuck Campbell reported from the Gap Filler Assessment Team. He stated that there is no detailed analysis on this type of damage from past history.

BNS/Scott Berry reported on STS-114 boundary layer transition (BLT) analysis. Both gap fillers protrude beyond the bounds of flight experience. Initial estimates predict very early transition based on flight history. Large uncertainties are associated with BLT correlations at high Mach number conditions. The initial estimate was outside of the Orbiter Configuration Control Board (OCCB) approved BLT protuberance correlation range. Mr. Berry concluded that the team is working with large uncertainties for this analysis.

BNS/Jerald Kinder reported on the reinforced carbon-carbon (RCC) aeroheating environment for early BLT. After reviewing the data, the aeroheating community

recommends a turbulent scaling factor of 1.8 on the RCC wing leading edge (WLE). Given the limited analysis to date, a higher value was selected for the parametric transition assessment. There is no flight or ground test data to anchor the current environment, and turbulent flow on the WLE due to early BLT is not within flight experience. Given the lack of corroborating test data, the current model may not bound the flight environment.

JSC-ES3/Don Curry reported on the turbulent heating on WLE for STS-114. He stated that exposed gap seals on the forward Orbiter lower surface would trip the boundary layer earlier in entry trajectory. Turbulent boundary layer effects will increase heating on the WLE. Arc Jet test data was used to establish the Space Shuttle Operations Data Book (SODB) limits for RCC, with 3,220°F as the single-mission temperature limit. The conditions identified from these analyses violate this limit for zone 3. The potential temperature increases because trajectory dispersions create an increased risk. Dr. Curry stated that Leading Edge Structure Subsystem (LESS) Problem Resolution Team (PRT) recommends removal of the gap fillers to eliminate this threat to the RCC WLE Panel assemblies.

BNS-ES/Dan Bell reported on the Thermal Protection System (TPS) PRT assessment of the protruding gap filler. The assessment of the Thermal Structural Evaluation Program (TSEP) body points identified negative structural margins in the aft fuselage with margins of -0.05 and -0.15 at Mach 21.5 transition, and -0.15 and -0.30 at Mach 24 transition. The Room-Temperature Vulcanizing (RTV) bondline temperatures exceeded the 625°F material limits in the mid fuselage at Mach 21.5, and in the mid and aft fuselage at Mach 24. The overall TPS perspective identifies a moderate risk due to potential errors in the assessment due to the extrapolations of multiple tools and current unknowns in penetration locations and damages not currently reassessed. Unknowns with effect on critical areas, coupled with limited negative margins, put the TPS PRT Team in a position of not being able to assure safe re-entry.

H. Solid Rocket Booster/Reusable Solid Rocket Motor (SRB/RSRM) Postflight Assessment Team (SPAT) Status Report

USA-SRB/Garry Moats gave a report on the STS-114 R+5 SPAT status. The SRB/RSRM preliminary assessment indicates higher than normal heating on external TPS surfaces. For the SRB the heating is at the high end of normal, but is out of family for the motor. .

Action 114-MMT-009 was assigned to SRB/RSRM to complete an analysis of potential impact sites to the SRB external surface to facilitate a decision to proceed with Hydrolase operations on STS-114. This action is due August 8, 2005.

I. External Tank (ET) Launch Data Evaluation

LMSSC-ET/Mike Quiggle reported that the ET electrical and structural systems performed nominally, and the propulsion system performed within requirements.

Investigation teams have been established to determine the root cause of the foam loss events. All foam loss dimensions are preliminary pending a final report from the Consolidated Film Review Team. On FD8, ET will give a report at the same level of detail regarding the in-flight status.

J. Management Decisions Summary

The MMT declared that removal of the two gap fillers would be performed. Mr. Hale polled the MMT and received concurrence that FD8 should proceed as planned.

K. Conclusion

Mr. Hale indicated the next MMT is scheduled for 1:00 p.m. CDT, Tuesday, August 2, 2005.

Detailed information on all assigned actions for this meeting can be found on the MMT Action log, located on the MMT web site at:
http://sspweb.jsc.nasa.gov/webdata/mmtmeeting/flt/114/050801.1300_D7/Actionlog.pdf

The MMT web site is available at <http://sspweb.jsc.nasa.gov/mmt/>.

The meeting adjourned at 4:51 p.m. CT.

MMT: August 1, 2005

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Minutes Writer	Date

Approvals:

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MMT Secretary	Date

<u>J. J. Conwell</u>	<u>August 1, 2005</u>
Customer Support Room (CSR) Duty Officer	Date

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LOCATION: JSC

DATE: 08/01/05

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